

MAINTAINING THE NATIVE PLANT COMMUNITY DURING LONGLEAF PINE (*Pinus palustris* Mill.) ESTABLISHMENT

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SUMMARY

Site preparation treatments were evaluated to determine which were useful for establishing longleaf pine seedlings without excessive long-term damage to the native understory. Hexazinone treatments of 1.1 to 2.2 kg/ha were sufficient to reduce woody competition and allow the successful establishment of longleaf seedlings using hand planting of containerized stock. Hexazinone at rates of 2.2 kg/ha followed by strip scalping and machine planting resulted in slightly higher seedling survival rates. Although there was some initial exposure of soil and a decline in grass cover, the understory soon recovered. Thus, this treatment can be used to re-establish longleaf without undue damage to the understory.

INTRODUCTION

Longleaf pine is the key tree species in a complex of fire-dependent ecosystems long native to the southeastern United States (1). It once occupied perhaps as much as 25 million hectares, stretching from southeastern Virginia south to central Florida and west into eastern Texas (2). These forests have been intensively exploited since colonial times with little regard for regeneration. Currently only 1.3 million hectares of longleaf pine forest remain. The continuing reduction of this important forest type carries with it a risk to the myriad of life forms characteristic of and largely dependent on longleaf pine ecosystems. The diversity of ground cover plants per unit area places longleaf pine ecosystems among the most species-rich plant communities outside the Tropics. Extreme habitat reduction is the main cause for the precarious state of at least 191 taxa of vascular plants (3).

The need to re-establish longleaf on former sites is now widely recognized. It is believed that native understory grasses, especially wiregrass (*Aristida stricta*) and woody shrubs can be strong competitors during the regeneration phase. Numerous mechanical site preparation systems have been used to reduce competition prior to planting longleaf seedlings. These were quite effective in increasing seedling survival but they also resulted in significant reductions in the native understory grasses. Two passes with a double drum chopper, for example, will nearly eliminate wiregrass from dry sites (4) and will severely reduce it on wet flatwoods sites (5). All soil-disturbing site preparation methods reduce wiregrass cover, and it does not seem to recover even after long periods of time (6). Using selective herbicides for site preparation appears to cause less long-term damage to the understory (7). The purpose of this study was to evaluate site preparation treatments to determine if alternative techniques could be found which were successful in both re-establishing longleaf and maintaining the native understory plant community.

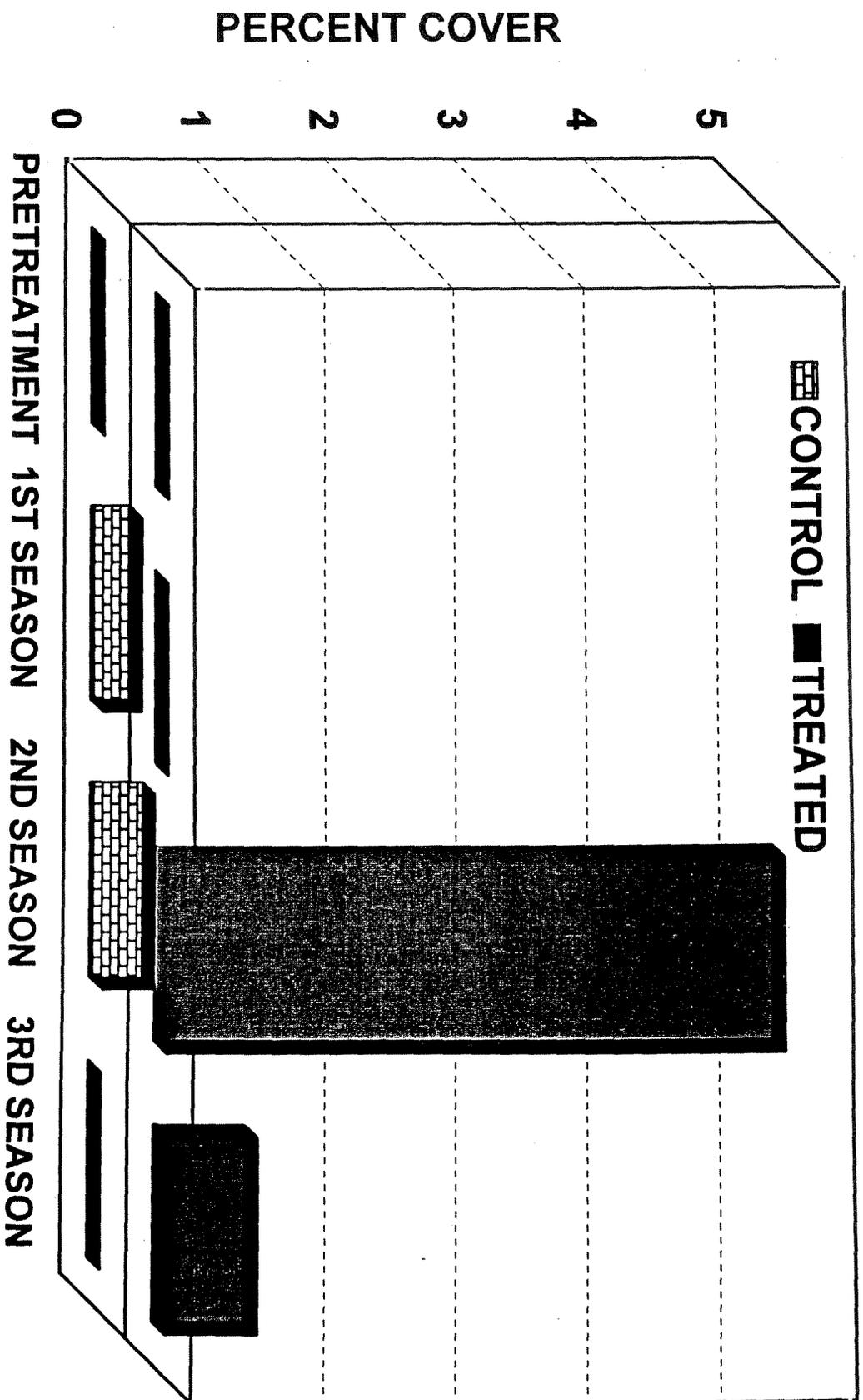


FIGURE 7. Change in *Baldunia angustifolia* cover over time on operational Hexazinone treated and control areas.

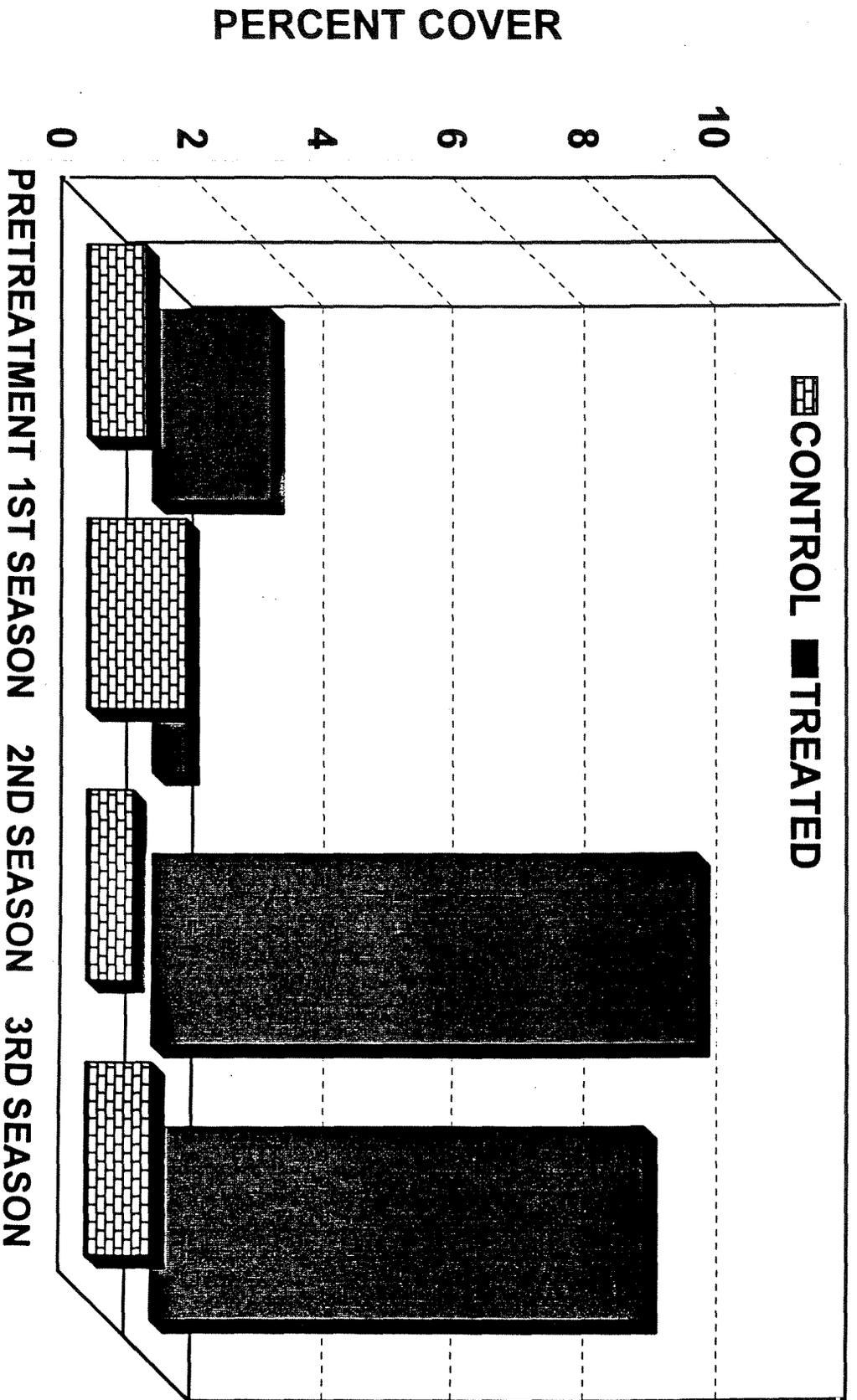


FIGURE 8. Change in Eupatorium compositifolium cover over time on operational Hexazinone treated and control areas.

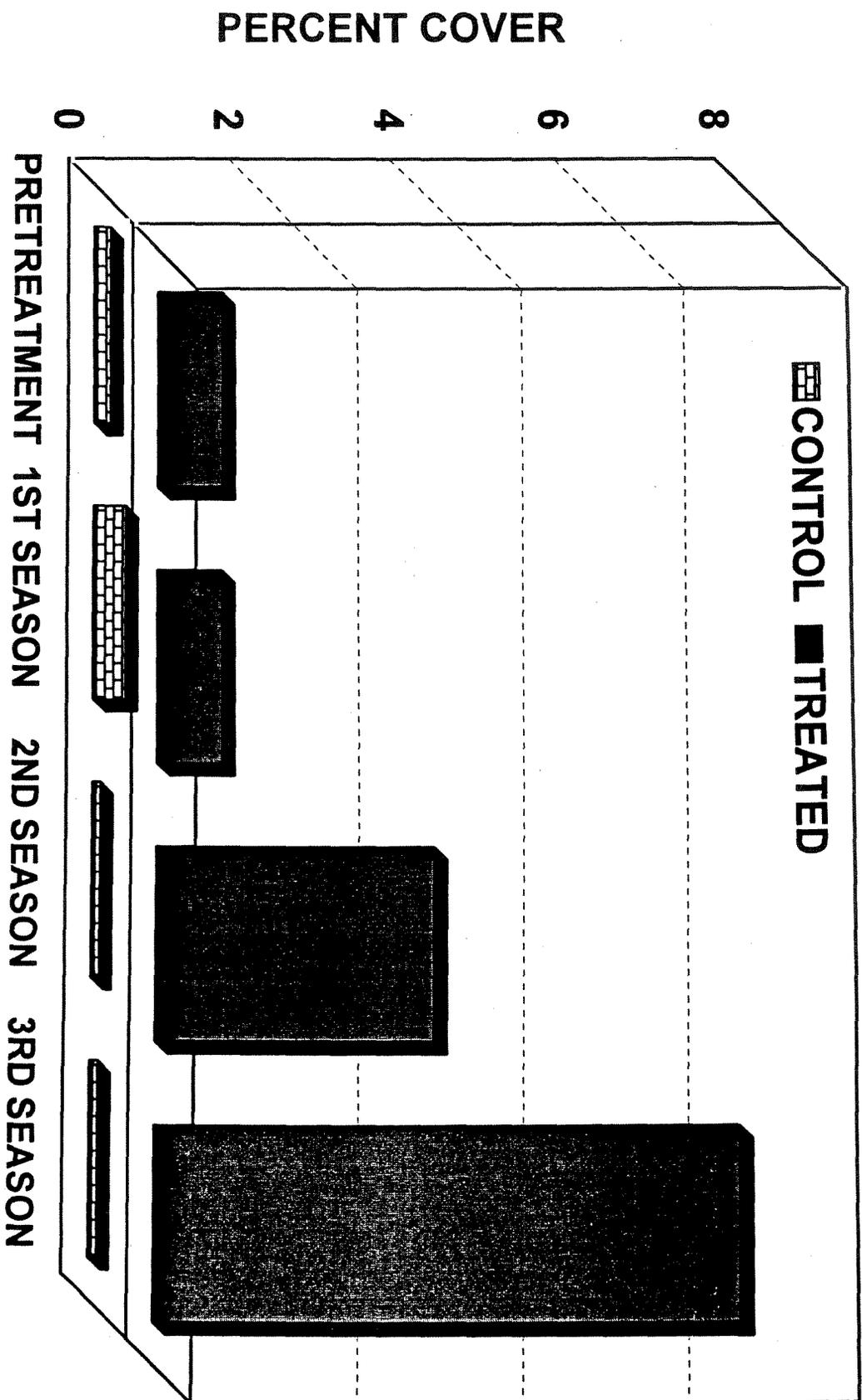


FIGURE 9. Change in Pityopsis graminifolia cover over time on treated operational Hexazinone treated and control areas.

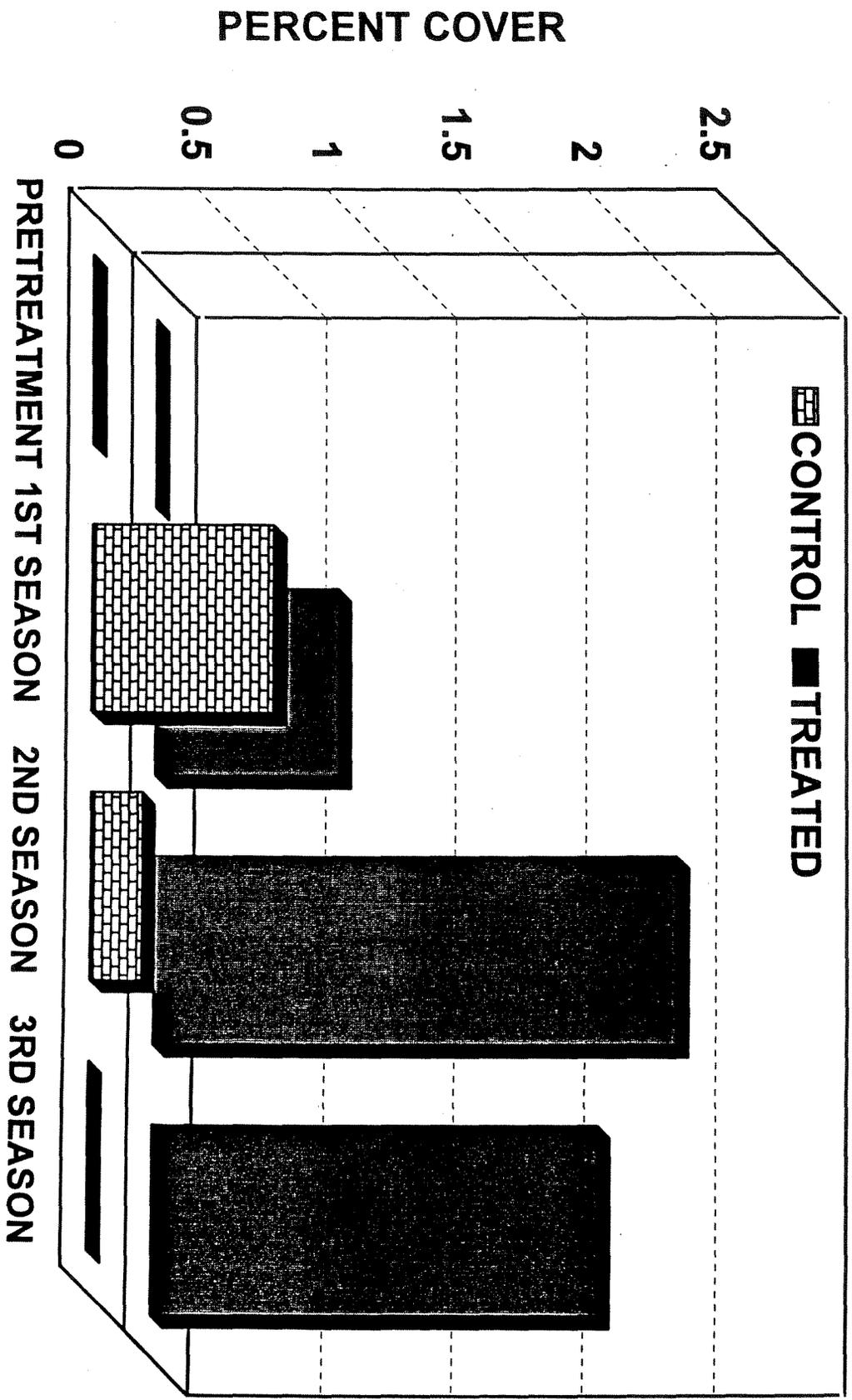


FIGURE 10. Change in *Polygonella gracilis* cover over time on operational Hexazinone treated and control areas.

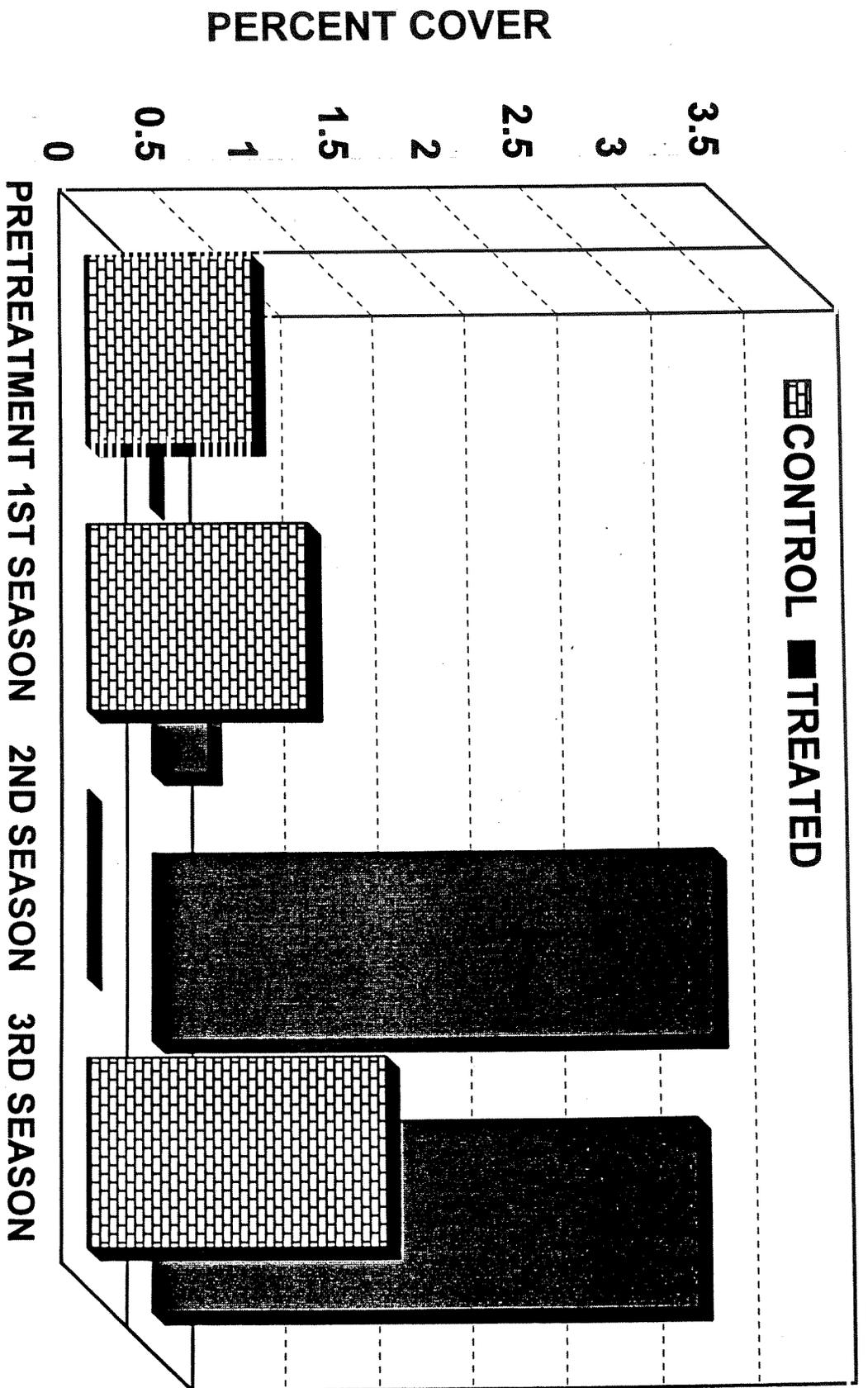


FIGURE 11. Change in *Sorghastrum secundum* cover over time on operational Hexazinone treated and control areas.

Block III

<i>Aristida stricta</i>	60.3	Bare soil	71.5	<i>Aristida stricta</i>	33.4	<i>Aristida stricta</i>	35.5
<i>Quercus laevis</i>	20.2	<i>Aristida stricta</i>	43.5	<i>Bulbostylis warei</i>	18.8	<i>Aristida purpurascens</i>	24.4
<i>Aristida purpurescens</i>	18.1	<i>Andropogon virginicus</i>	16.2	<i>Eupatorium compositifolium</i>	14.5	<i>Pityopsis graminifolia</i>	17.1
<i>Andropogon virginicus</i>	16.8	<i>Aristida purpurascens</i>	14.2	<i>Andropogon virginicus</i>	13.8	<i>Eupatorium compositifolium</i>	14.4
<i>Panicum spp.</i>	12.1	<i>Eupatorium compositifolium</i>	8.5	Bare soil	13.8	<i>Andropogon virginicus</i>	13.6
<i>Ceratiola ericoides</i>	11.1	<i>Panicum spp.</i>	6.1	<i>Aristida purpurascens</i>	13.7	<i>Bulbostylis warei</i>	10.2
<i>Galactia elliptica</i>	10.2	<i>Sabal etonia</i>	6.0	<i>Balduina angustifolia</i>	12.8	<i>Panicum spp.</i>	9.9